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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/772,699

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Leroy M. Edwards

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Harness Dickey & Pierce, P.L.C.  
P.O. Box 828  
Bloomfield Hills, MI 48303

EXAMINER

WALKER, KEITH D

ART UNIT

PAPER NUMBER

1795

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DELIVERY MODE

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/772,699	<b>Applicant(s)</b> EDWARDS ET AL.	
	<b>Examiner</b> KEITH WALKER	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5,7,9-13,15,17,18 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,7,9-13,15,17,18 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

Claims 1-5, 7, 9-13, 15, 17, 18 and 20 are pending examination as discussed below.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-5, 7, 9, 11-13, 15, 18 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0160245 (Genc) in view of US 2002/0114984 (Edlund) and US 2005/0058861 (Pettit).

Genc teaches a fuel cell system with a hydrogen flow path for the anode and a coolant flow path for the fuel cell. The cooling flow path includes a coolant reservoir that has a first enclosure. A passive gas vent is located in the coolant flow path and vents gas from the first enclosure without any electrical devices or active components (Abstract, Figs. 1 & 2, [0007, 0010, 0019]). The gas vent enables the passage of gas but not liquid and is a porous material made of plastic or metal and is located in the wall of the coolant reservoir (Figs. 3-6; [0021-0023, 0031]). Hydrogen gas is known to become one of the gases that can build up in a cooling system liquid and so the vent is a hydrogen vent since Genc teaches venting all gases from the cooling liquid. Using this selectively permeable membrane keeps the fuel cell system safe by allowing the

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unwanted gas to pass thereby reducing the buildup of explosive gas such as hydrogen, while keeping the wanted coolant liquid as evidenced by Pettit (Fig. 1; [0024, 0030]).

Genc is silent to maintaining the hydrogen concentration below 4 percent or below 1 percent.

Pettit teaches a fuel cell system with a hydrogen flow path for the anode and a coolant flow path for cooling the fuel cell (Abstract, Fig. 1). The coolant flow path has a reservoir (58) and as such a first enclosure that encompasses part of the coolant flow path (Figs. 1-3; [0021, 0024]). The coolant reservoir has a vent that passes any gas, including hydrogen, from the coolant stream. The fuel cell system has a second enclosure (40) that encompasses a part of the hydrogen flow path and a second hydrogen vent that allows the hydrogen to escape the second enclosure (42) ([0030, 0031]). The hydrogen concentration is kept below 4% and preferably 1% ([0032]).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the vent of Genc to conform to the hydrogen concentration standards taught by Pettit to keep the hydrogen concentration to a level that allows for safe operation of the fuel cell system.

Genc is silent to a second enclosure or third enclosure, each with a passive hydrogen vent.

Edlund teaches a fuel cell system that is contained inside a housing (140), which is further contained within another housing (142) (Abstract, Fig. 11; [0062-0064]). The housing allows for easy the integration of the complete fuel cell system into an electric dependent device.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the fuel cell system of Genc with the housing of Edlund to allow for easy integration of the fuel cell into electric devices. While Edlund is silent to providing a vent in the housing, it would be obvious to one skilled in the art to vent each of the housings with the passive vent taught by Genc to prevent the build up of hydrogen gas such that it would create an unsafe and explosive situation.

2. Claims 10 & 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0160245 (Genc) in view of US 2002/0114984 (Edlund) and US 2005/0058861 (Pettit) as applied to claims 1 & 11 and further in view of US Patent 4,168,349 (Buzzelli).

The teachings of Genc, Edlund and Pettit as discussed above are incorporated herein.

Genc is silent to the vent configured to as a flame barrier.

Buzzelli teaches a hydrogen vent that acts as a flame and explosion barrier (2:55-65). Using a hydrogen vent that also blocks flames increases the safety of the fuel cell system.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the vent of Genc with the flame barrier vent of Buzzelli to improve the safety of the fuel cell device.

3. Claims 1-5, 7, 11-13, 15 & 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2005/0106438 (Hobmeyr) in view of US 2005/0058861 (Pettit).

Hobmeyr teaches a fuel cell system with a hydrogen flow path and a coolant flow path. The coolant flow path includes a coolant reservoir, which has a first enclosure (Abstract, Fig. 1; [0002-0006, 0018]). A first passive vent, which does not require any electrical or active components to function, is included in the coolant system to vent hydrogen that has accumulated in the coolant system. The vent comprises a porous material made of plastic or metal and can be located anywhere along the coolant circulation path, like the coolant reservoir ([0019, 0022, 0023, 0026, 0027]).

Hobmeyr is silent to the hydrogen vent preventing coolant from passing through the vent. However, as the vent is suppose to allow hydrogen to vent from a coolant stream and Hobmeyr only discusses the hydrogen gas passing through the vent, it is implied that the vent is impermeable to coolant. Alternatively, it would be obvious to one skilled in the art that the vent would not allow the passage of coolant to keep from having to constantly refill the coolant that is lost through the vent.

Hobmeyr is silent to a second enclosure and keeping the level of hydrogen below 4 percent or below 1 percent.

Pettit teaches a fuel cell system with a hydrogen flow path for the anode and a coolant flow path for cooling the fuel cell (Abstract, Fig. 1). The coolant flow path has a reservoir (58) and as such a first enclosure that encompasses part of the coolant flow path (Figs. 1-3; [0021, 0024]). The coolant reservoir has a vent that passes any gas, including hydrogen, from the coolant stream. The fuel cell system has a second enclosure (40) that encompasses a part of the hydrogen flow path and a second hydrogen vent that allows the hydrogen to escape the second enclosure (42) ([0030,

0031])). The teaching of the second enclosure illustrates how different components can be incorporated together for integration into a system. The hydrogen concentration is kept below 4% and preferably 1% ([0032]).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the vent of Hobmeyr to conform to the hydrogen concentration standards taught by Pettit to keep the hydrogen concentration to a level that allows for safe operation of the fuel cell system. Furthermore, it would be obvious to use the second enclosure with a hydrogen vent taught by Pettit to allow easy integration of the fuel cell into a system while reducing the risk of hydrogen gas build-up to unsafe levels.

4. Claims 9 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2005/0106438 (Hobmeyr) in view of US 2005/0058861 (Pettit) as applied to claims 1 & 11 and further in view of US 2002/0114984 (Edlund).

The teachings of Hobmeyr and Pettit as discussed above are incorporated herein.

Hobmeyr is silent to a third enclosure with a passive hydrogen vent.

Edlund teaches a fuel cell system that is contained inside a housing (140), which is further contained within another housing (142) (Abstract, Fig. 11; [0062-0064]). The housing allows for easy the integration of the complete fuel cell system into an electric dependent device.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the fuel cell system of Hobmeyr with the housing of Edlund to allow for easy integration of the fuel cell into electric devices. While Edlund is silent to providing a vent in the housing, it would be obvious to one skilled in the art to vent each of the housings with the passive vent taught by Hobmeyr and Pettit to prevent the build up of hydrogen gas such that it would create an unsafe and explosive situation. Combining prior art elements according to known methods to yield predictable results and using known techniques to improve similar devices in the same way are considered obvious to one of ordinary skill in the art (KSR, MPEP 2141 (III)).

5. Claims 10 & 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2005/0106438 (Hobmeyr) in view of US 2005/0058861 (Pettit) as applied to claims 1 & 11 and further in view of US Patent 4,168,349 (Buzzelli).

The teachings of Hobmeyr and Pettit as discussed above are incorporated herein.

Hobmeyr is silent to the vent configured to as a flame barrier.

Buzzelli teaches a hydrogen vent that acts as a flame and explosion barrier (2:55-65). Using a hydrogen vent that also blocks flames increases the safety of the fuel cell system.



Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the vent of Hobmeyr with the flame barrier vent of Buzzelli to improve the safety of the fuel cell device.

### ***Response to Arguments***

Applicant's arguments filed 1/7/10 have been fully considered but they are not persuasive.

As a whole applicant's arguments are not commensurate with the rejections of record. Applicant provides an interpretation of the references and then argues against that interpretation. However, the rejections of record are not based on the combination of references as presented by applicant.

The following will address the arguments presented as best can be understood. Applicant argues the combination of Genc, Pettit and Edlund does not meet the claimed invention because the prior art does not teach a first passive hydrogen vent in a first enclosure and a second hydrogen vent in a second enclosure. Genc teaches the first passive hydrogen vent in the first enclosure, where the first enclosure encloses a part of the cooling flow path. Same features as claimed. Edlund teaches that it is well known in the art to add enclosures around fuel cell systems. Adding a hydrogen vent to an enclosure would be obvious to one of ordinary skill in the art to prevent the build-up of hydrogen gas and create an explosive mixture of gases. Pettit teaches that it is well known in the art to keep the hydrogen concentration below 4%. Since the reference teach all of the claimed elements, the claims are obvious in view of the cited prior art.

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Applicant's argument to the random combination of different components of the references as applied by applicant is unclear. US 5,623,390 (Noda) provides evidence that it is well known in the art to prevent a build up of hydrogen in enclosed areas (Figs. 1, 3 & 11; 9:5-40). The battery has hydrogen vents (46, 47), the enclosure holding the battery has hydrogen vents (50, 51), and the body that holds the enclosure has hydrogen vents (44, 45). Preventing a build up of hydrogen using vents in each successive casing is well known in the art.

Applicant argues the combined teachings of Hobmeyr and Pettit do not teach a first passive hydrogen vent in a first enclosure and a second hydrogen vent in a second enclosure. As discussed in the rejection, Hobmeyr teaches a first passive hydrogen vent in a first enclosure, where the first enclosure encompassing at least a part of the cooling flow path. Pettit teaches a second enclosure with a hydrogen vent. The second hydrogen vent, as claimed, does not preclude using electrical devices or other active components to function. Therefore, applicant's arguments are not commensurate in scope with the claims. Pettit's teachings of a second hydrogen vent that uses a compressor and ventilation system are commensurate in scope with the claimed second vent. Furthermore, the claimed invention does not preclude the vent from having a catalytic function. The claimed invention is met by the combined teachings of Hobmeyr and Pettit.

The prior art of Edlund teaches that it is well known in the art to encase fuel cell systems and for the reasons well known in the art and presented in the prior art, exhausting hydrogen from any of the cases that could build up hydrogen would be

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obvious to one skilled in the art, regardless of the number of enclosures. As discussed above, US 5,623,390 (Noda) provides evidence that it is well known in the art to prevent a build up of hydrogen in enclosed areas (Figs. 1, 3 & 11; 9:5-40). The battery has hydrogen vents (46, 47), the enclosure holding the battery has hydrogen vents (50, 51), and the body that holds the enclosure has hydrogen vents (44, 45). Preventing a build up of hydrogen using vents in each successive casing is well known in the art.

Regarding the teachings of Buzzelli, applicant only argues this reference fails to overcome the presumed deficiencies of the other prior art presented. Since no new arguments are presented with regard to Buzzelli, no response is required. The teachings of Buzzelli stand as discussed in the rejections.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEITH WALKER whose telephone number is (571)272-3458. The examiner can normally be reached on Mon. - Fri. 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Keith Walker/  
Examiner, Art Unit 1795